KANAKA RAPIDS RANCH WATER SYSTEM INC. (PWS 5420089)
SOURCE WATER ASSESSMENT FINAL REPORT

July 1, 2002

State of Idaho
Department of Environmental Quality

Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the act. This assessment is based on a land use inventory of the designated assessment area, sensitivity factors associated with the wells, and aquifer characteristics.

This report, *Source Water Assessment for the Kanaka Rapids Ranch Water System Inc., Twin Falls County* describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

Final susceptibility scores are derived from equally weighting system construction scores, hydrologic sensitivity scores, and potential contaminant/land use scores. Therefore, a low rating in one or two categories coupled with a higher rating in another category results in a final rating of low, moderate, or high susceptibility. With the potential contaminants associated with most urban and heavily agricultural areas, the best score a well can get is moderate. Potential contaminants are divided into four categories, inorganic contaminants (IOCs, i.e. nitrates, arsenic), volatile organic contaminants (VOCs, i.e. petroleum products), synthetic organic contaminants (SOCs, i.e. pesticides), and microbial contaminants (i.e. bacteria). As different wells can be subject to various contamination settings, separate scores are given for each type of contaminant.

The Kanaka Rapids Ranch Water System Inc. drinking water system (PWS 5420089) consists of three ground water wells, two of which (Well #1 S and #2 Riverside) are used, regulated, and addressed in this report. The system serves approximately 100 persons through 45 connections, though the population fluctuates as new residential construction continues. In terms of total susceptibility, the wells rate moderate for IOCs, VOCs, SOCs, and microbial contamination. These rating are mainly due to the moderate ratings of hydrologic sensitivity, system construction, and the lack of potential contaminant sources.

The IOCs chromium and fluoride have been detected in the sampled water at levels below the primary maximum contaminant levels (MCLs). However, the secondary MCL for fluoride is 2.0 mg/l, and the Kanaka Rapids Ranch Water System Inc. wells exceeded this level in December 2000 (Well #1 = 2.5 mg/l; Well #2 = 3.3 mg/l). Additionally, arsenic concentrations are in the range of 0.011 milligrams per liter (mg/l) to 0.015 mg/l. In October 2001, the EPA lowered the arsenic MCL from 0.05 mg/L to 0.01 mg/L. However, public water systems have until 2006 to meet the new requirement. Since the arsenic concentrations appear to be a natural constituent of the aquifer, the Kanaka Rapids Ranch Water System Inc. will have to deal with this problem. Nitrate levels have been consistently below 2.0 mg/l. No VOCs, SOCs, or microbial contaminants have been detected in the wells.

Even though the Kanaka Rapids Ranch Water System Inc. has never recorded a contaminant above a primary MCL, they should be aware that the potential for contamination still exists. The potential contaminant sources are associated with the aquaculture land uses of the area. County wide agricultural land use practices have contributed to the ratings of "High" for county level nitrogen fertilizer use, county level herbicide use, and total county level ag-chemical use. Additionally, the delineations cross an SOC Priority Area for the pesticide Atrazine.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources. If the system should need to expand in the future, new well sites should be located in areas with as few potential sources of contamination as possible, and the site should be reserved and protected for this specific use.

For the Kanaka Rapids Ranch Water System Inc., drinking water protection activities should first focus on continued maintenance of the wellhead and sanitary seal. Additionally, the sanitary survey (an inspection conducted every five years with the purpose of determining the physical condition of a water system's components and its capacity) of April 2001 states that all well locations need cleaning, birds are entering well house #2, all discharge to waste lines must be screened and faced downward. These deficiencies should be corrected.

Though total coliform bacteria have not been detected in the system water, the Kanaka Rapids Ranch Water System Inc. should consider installing a disinfection system if this problem arises. Though treatment of fluoride is not required between 2.0 mg/l and 4.0 mg/l, the levels should be closely monitored as the source water has recorded concentrations above the secondary MCL of 2.0 mg/l. Any spills from the potential contaminant sources or nearby creeks should be carefully monitored, as should any future development in the delineated areas. Other practices aimed at reducing the leaching of agricultural chemicals from agricultural land within the designated source water areas should be implemented.

Because the arsenic in the wells is greater than the level of the revised MCL, the system may need to consider implementing engineering controls to monitor and maintain or reduce the level of this contaminant in the water system. The EPA plans to provide up to $20 million over the next two years for research and development of more cost-effective technologies to help small systems meet the new MCL (www.epa.gov). The Kanaka Rapids Ranch Water System Inc. will likely need to investigate engineering controls of the natural arsenic in the water. Currently, the EPA has stated that these upgrades must be completed by the year 2006.

Most of the designated areas are outside the direct jurisdiction of the Kanaka Rapids Ranch Water System Inc. Twin Falls County has a Wellhead Protection Overlay District Ordinance that can provide additional protection for areas outside the direct jurisdiction of the Kanaka Rapids Ranch Water System Inc.

Partnerships with state and local agencies and industry groups should be established and are critical to success. Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan as the delineations are near residential land uses areas. Public education topics could include proper lawn and garden care practices, household hazardous waste disposal methods, proper care and maintenance of septic systems, and the importance of water conservation to name but a few. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA. There are transportation corridors near the delineations, therefore the Department of Transportation should be involved in protection activities. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the local Soil Conservation District, and the Natural Resources Conservation Service.

A community must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Twin Falls Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR THE KANAKA RAPIDS RANCH WATER SYSTEM INC., IDAHO

Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this source means.** A map showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are attached. The list of significant potential contaminant source categories and their rankings, used to develop this assessment, is also attached.

Level of Accuracy and Purpose of the Assessment

The Idaho Department of Environmental Quality (DEQ) is required by the U.S. Environmental Protection Agency (EPA) to assess the over 2,900 public drinking water sources in Idaho for their relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area, sensitivity factors associated with the wells, and aquifer characteristics. All assessments must be completed by May of 2003. The resources and time available to accomplish assessments are limited. Therefore, an in-depth, site-specific investigation to identify each significant potential source of contamination for every public water system is not possible. **This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

The ultimate goal of this assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. The Idaho Department of Environmental Quality (DEQ) recognizes that pollution prevention activities generally require less time and money to implement than treating a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a drinking water protection program should be determined by the local community based on its own needs and limitations. Wellhead or drinking water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Section 2. Conducting the Assessment

General Description of the Source Water Quality

The Kanaka Rapids Ranch Water System Inc. is a community system that serves approximately 100 people through 45 connections. The wells are located in Twin Falls County, to the south of the Snake River and to the north of the City of Buhl (Figure 1). The public drinking water system for the Kanaka Rapids Ranch Water System Inc. is currently comprised of three ground water wells, though Well #3 is unused and unregulated. This report only assesses Well #1 and #2. If the status of Well #3 changes in the future, this report will be amended.

The main IOC water chemistry issue recorded in the public water system is arsenic, which naturally occurs at levels of about 0.015 mg/l. The background levels are greater than the revised MCL of 0.010 mg/l. Additionally, fluoride concentrations are above the secondary MCL level of 2.0 mg/l. No VOCs, SOCs, or total coliform bacteria have been detected in the well water.

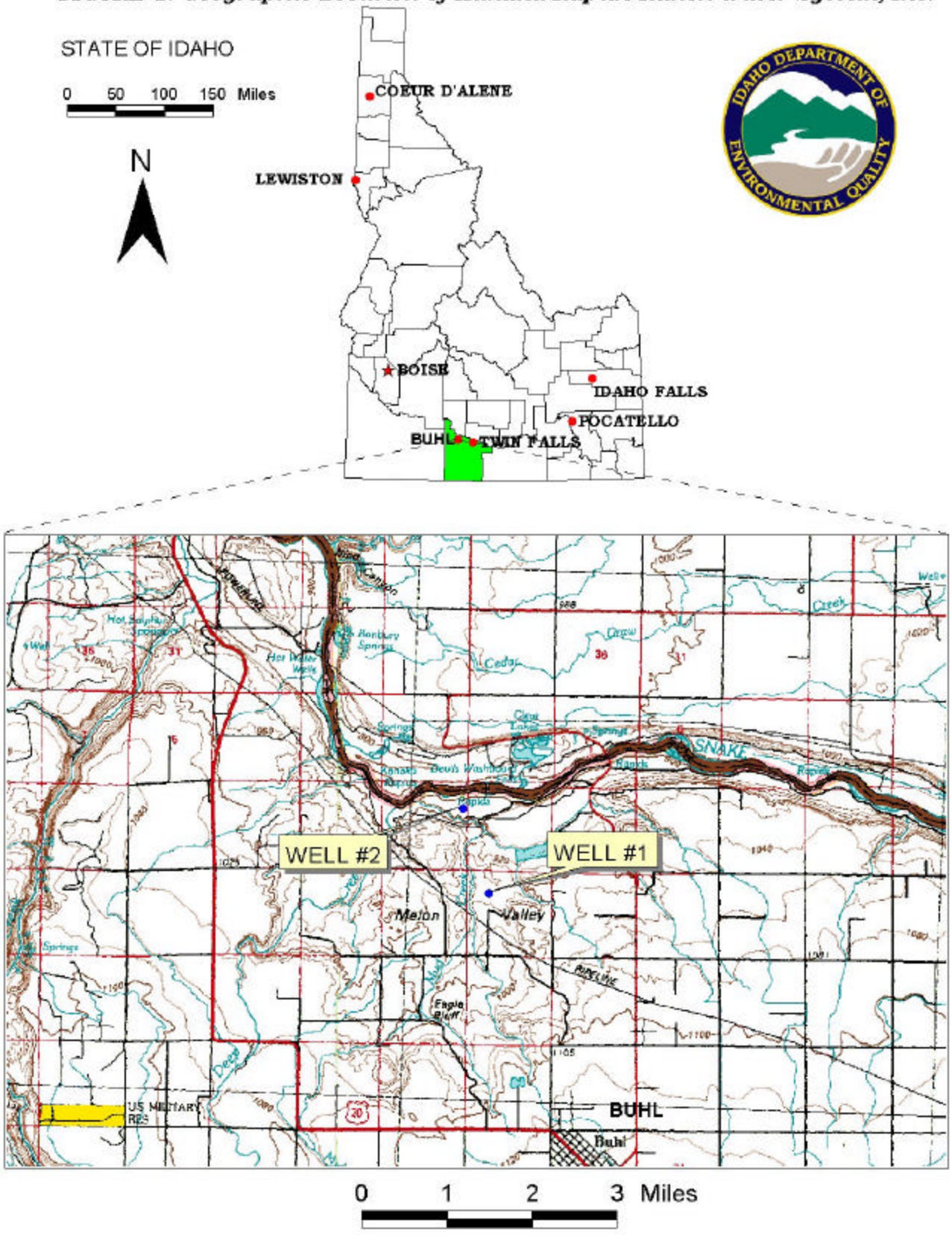
The Kanaka Rapids Ranch Water System Inc. wells are located within a number of identified priority areas related to county agricultural practices. County level nitrate use, county level herbicide use, and total county level agricultural chemical use are high for the delineated area. These high ratings apply to all wells within the county. The delineation crosses an SOC priority area (any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards) for the pesticide Atrazine.

Defining the Zones of Contribution – Delineation

The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time-of-travel zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. DEQ used a refined computer model approved by the EPA in determining the time-of-travel (TOT) zones for water associated with the Banbury Basalt of Salmon Falls – Rock Creek hydrologic province in the vicinity of the Kanaka Rapids Ranch Water System Inc. The computer model used site-specific data, assimilated by DEQ from a variety of sources including local area well logs and hydrogeologic reports summarized below.

The wells extract water from the Banbury Basalt and possibly the Idavada Volcanics. The Idavada Volcanics unit consists of welded ash and tuff, rhyolite, and some basalt flows. The Idavada Volcanics are up to 2,000 feet thick in the Castleford area and contain fractures and columnar joints, allowing some mixing of the geothermal ground water in the Idavada Volcanics with ground water in the Banbury Basalt, which overlies the Idavada Volcanics (Lewis and Young, 1989). The Banbury Basalt is of variable thickness and is the primary non-geothermal aquifer in the Castleford area (Moffat and Jones, 1984). Basalt flows fracture at the surface as they cool. The fractures occur in the horizontal direction throughout the flow. The Banbury Basalt is fractured and contains thin sedimentary interbeds. These fractures and sedimentary interbeds comprise the water producing zones in the Banbury Basalt. A shallow, perched aquifer exists above the Banbury Basalt and extends from Buhl east to Twin Falls (Cosgrove, et al., 1997), but does not impact the Kanaka Rapids Ranch Water System Inc. wells. Regional ground water flow is to the north, but may vary with proximity to major creeks and the Snake River (Lewis and Young, 1989). Locally, ground water flow is to the north.

FIGURE 1. Geographic Location of Kanaka Rapids Ranch Water System, Inc.



The delineated source water assessment area for the Kanaka Rapids Ranch Water System Inc. wells can best be described as corridors, approximately ¼ mile wide and 1 mile long, extending to the south from the Kanaka Rapids Ranch Water System Inc. (Figure 2). The actual data used by DEQ in determining the source water assessment delineation areas are available upon request.

Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of ground water contamination. The locations of potential sources of contamination within the delineation area were obtained by field surveys conducted by DEQ and the Kanaka Rapids Ranch Water System Inc. and from available databases (see Table 1).

The dominant land use outside the Kanaka Rapids Ranch Water System Inc. area is undetermined agriculture. Land use within the immediate area of the wellheads consists of residential and aquaculture activities. A pipeline and Mud Creek cross the delineations.

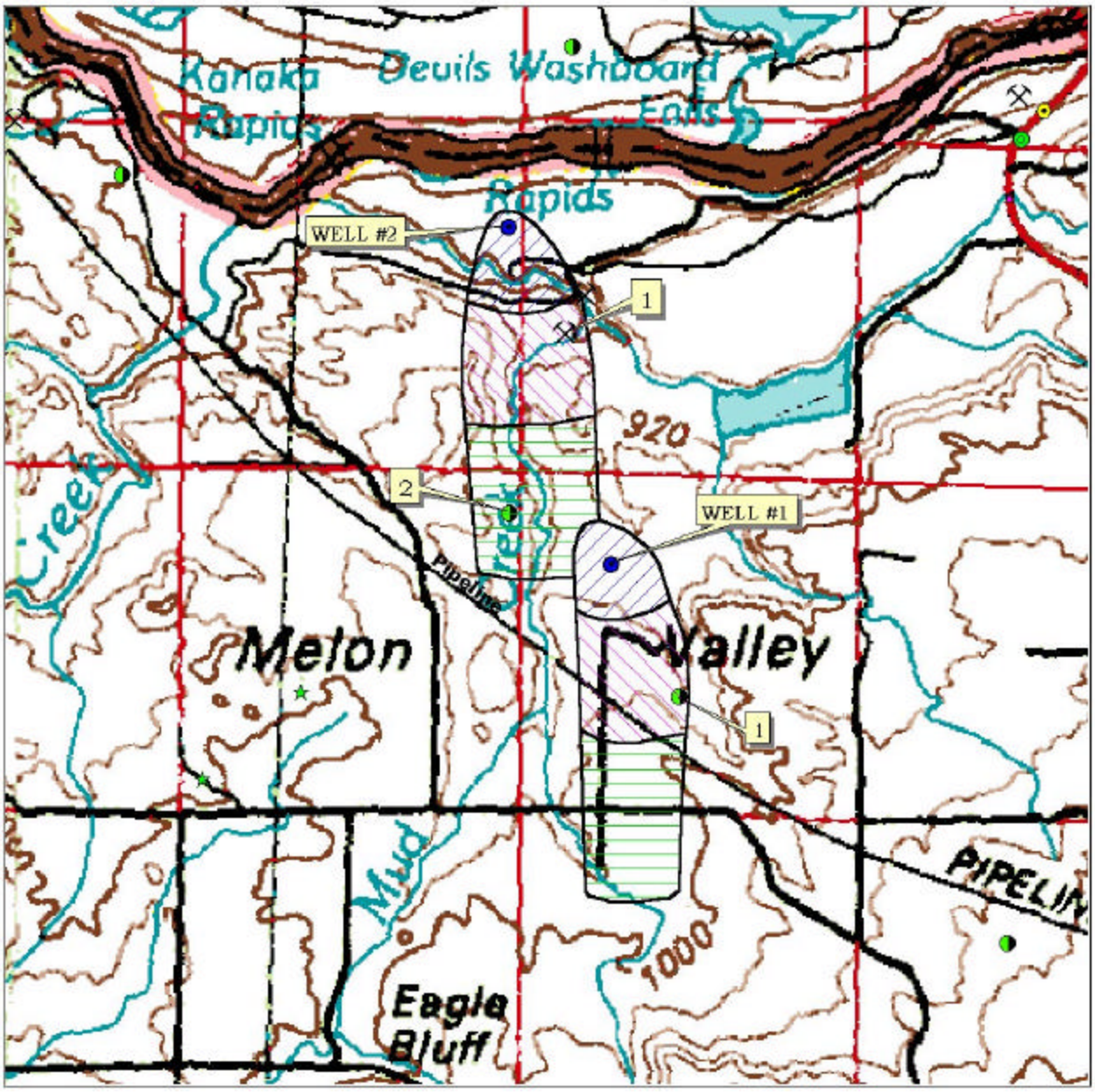
It is important to understand that a release may never occur from a potential source of contamination provided best management practices are used at the facility. Many potential sources of contamination are regulated at the federal level, state level, or both, to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination, such as educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

Contaminant Source Inventory Process

A contaminant inventory of the study area was conducted in May of 2001. This involved identifying and documenting potential contaminant sources within the Kanaka Rapids Ranch Water System Inc. Source Water Assessment Area through the use of computer databases and Geographic Information System maps developed by DEQ. Susie Nystrom, the Kanaka Rapids Ranch Water System Inc. operator, confirmed this information.

Table 1 contains a listing of the potential contaminant sources that cross each of the two delineations. Well #1 contains an aquaculture discharge point regulated under the National Pollutant Discharge Elimination System (NPDES), a pipeline, and a creek. Well #2 contains a sand and gravel pit, Mud Creek, and an aquaculture discharge point regulated under NPDES.

Figure 2. Kanaka Rapids Ranch Water System District Delineation Map and Potential Contaminant Source Locations



0 0.5 1 1.5 2 Miles

N

LEGEND

Time of Travel Zones
10 (3 yr TOT)
3 (6 yr TOT)
3 (10 yr TOT)
Wellhead
Enhanced Inventory
CERCLIS Site
RICRIS Site
Dairy
LUST Site
Closed UST Site
Open UST Site
Business Mailing List
NPDES Site
Mine
AST
Toxic Release Inventory
SARA Title III Site (EPCRA)
Recharge Point
Injection Well
Group1 Site
Cyanide Site
Landfill
Wastewater Land App Site

IDAHO DEPARTMENT OF ENVIRONMENTAL QUALITY

PWS# 5420089
WELL #1 and #2

Table 1. Kanaka Rapids Ranch Water System Inc., Potential Contaminant Inventory

Well # - Site #	Source Description	TOT Zone[1] (years)	Source of Information	Potential Contaminants[2]
1-1	NPDES	3-6	Database Search	IOC, Microbes
	Pipeline	3-10	GIS Map	VOC, SOC
	Unnamed Creek	6-10	GIS Map	IOC, VOC, SOC
2-1	Sand and Gravel Pit	3-6	Database Search	IOC, VOC, SOC
2-2	NPDES	6-10	Database Search	IOC, Microbes
	Mud Creek	0-10	GIS Map	IOC, VOC, SOC, Microbes

[1] TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead
[2] IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Section 3. Susceptibility Analyses

Each well's susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

The hydrologic sensitivity of a well is dependent upon four factors: the surface soil composition, the material in the vadose zone (between the land surface and the water table), the depth to first ground water, and the presence of a 50-foot thick fine-grained zone above the producing zone of the well. Slowly draining soils such as silt and clay typically are more protective of ground water than coarse-grained soils such as sand and gravel. Similarly, fine-grained sediments in the subsurface and a water depth of more than 300 feet protect the ground water from contamination.

The hydrologic sensitivity for the wells were moderate (see Table 2). The factor that lowered the score from high to moderate was that the soils are moderately- to poorly-drained. Well #1 has a water table of 65 feet and Well #2 is artesian. The vadose zone is comprised of fractured rock and there are no thick fine-grained layers retarding the downward movement of contaminants.

Well Construction

Well construction directly affects the ability of the well to protect the aquifer from contaminants. System construction scores are reduced when information shows that potential contaminants will have a more difficult time reaching the intake of the well. Lower scores imply a system is less vulnerable to contamination. For example, if the well casing and annular seal both extend into a low permeability unit, then the possibility of contamination is reduced and the system construction score goes down. If the highest production interval is more than 100 feet below the water table, then the system is considered to have better buffering capacity. If the wellhead and surface seal are maintained to standards, as outlined in sanitary surveys, then contamination down the well bore is less likely. If the well is protected from surface flooding and is outside the 100-year floodplain, then contamination from surface events is reduced.

The Kanaka Rapids Ranch Water System Inc. drinking water system consists of two wells that extract ground water for community uses. The wells rated moderate susceptibility for system construction. The 2001 Sanitary Survey found that the wellheads and surface seals were maintained and that the wells were protected from surface flooding. Additionally, the most productive zones were greater than 100 feet below the water table.

Well #1 was drilled in 1979 to a depth of about 270 feet below ground surface (bgs). The water table is at 65 feet bgs. The casing is set to about 82 feet bgs into "hard black lava" and the surface seal is set to about 30 feet bgs into "decomposed lava." The production zones range from 150 feet bgs to 270 feet bgs. Well #2 was installed in 1979 to a depth of 950 feet bgs and flows artesian. The surface seal and casing are both set to 156 feet into "black lava." Though the Kanaka Rapids Ranch Water System Inc. wells met well construction standards at the time of installation, system construction scores are rated against current standards (DEQ, 1999), which are stricter.

The Idaho Department of Water Resources *Well Construction Standards Rules* (1993) require all Public Water Systems (PWSs) to follow DEQ standards as well. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works* (1997) during construction. Some of the requirements include casing thickness, well tests, and depth and formation type that the surface seal must be installed into. Table 1 of the *Recommended Standards for Water Works* (1997) lists the required steel casing thickness for various diameter wells. Six-inch diameter wells require a casing thickness of at least 0.280-inches and eight-inch diameter wells require a casing thickness of 0.322-inches. Both of the Kanaka Rapids Ranch Water System Inc. wells have 0.250-inch thick casing leading to each receiving an additional point in the system construction category because they do not meet current well construction standards.

Potential Contaminant Source and Land Use

Both wells rated moderate for IOCs (e.g., arsenic, nitrate) and SOCs (e.g., pesticides), and low for microbial contaminants (e.g., bacteria). Well #1 rated low and Well #2 rated moderate for VOCs (e.g., petroleum products). The agricultural related priority areas and the potential contaminant sites contributed the largest numbers of points to the contaminant inventory rating. County level nitrogen fertilizer use, county level herbicide use, and total county level ag-chemical use are rated as high for all wells in the county. In addition, the delineations fall within an SOC priority area for the pesticide Atrazine.

Final Susceptibility Rating

An IOC detection above a drinking water standard MCL, any detection of a VOC or SOC, or a detection of total coliform bacteria or fecal coliform bacteria at the wellhead will automatically give a high susceptibility rating to a well, despite the land use of the area, because a pathway for contamination already exists. Additionally, if there are contaminant sources located within 50 feet of the source then the wellhead will automatically get a high susceptibility rating. Hydrologic sensitivity and system construction scores are heavily weighted in the final scores. Having multiple potential contaminant sources in the 0- to 3-year time-of-travel zone (Zone 1B) and much agricultural land contribute greatly to the overall ranking. In terms of total susceptibility, both wells rated moderate for IOCs, VOCs, SOCs, and microbial contaminants.

Table 2. Summary of the Kanaka Rapids Ranch Water System Inc. Susceptibility Evaluation

Source	Susceptibility Scores[1]									
	Hydrologic Sensitivity	Contaminant Inventory				System Construction	Final Susceptibility Ranking			
		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
Well #1	M	M	L	M	L	M	M	M	M	M
Well #2	M	M	M	M	L	M	M	M	M	M

[1]**H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility**
IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Susceptibility Summary

In terms of total susceptibility, the wells rated moderate for all categories. Aquaculture land uses, high county level nitrogen fertilizer use, and high county level herbicide use contributed the most land use points to the susceptibility rating. Moderate hydrologic sensitivity and being in compliance with wellhead, sanitary seal, and surface flooding protection led to the overall scores.

The IOCs chromium and fluoride have been detected in the sampled water at levels below the primary MCLs. However, the secondary MCL for fluoride is 2.0 mg/l, and the Kanaka Rapids Ranch Water System Inc. wells exceeded this level in December 2000 (Well #1 = 2.5 mg/l; Well #2 = 3.3 mg/l). Additionally, arsenic concentrations are in the range of 0.011 mg/l to 0.015 mg/l. In October 2001, the EPA lowered the arsenic MCL from 0.05 mg/L to 0.01 mg/L. However, public water systems have until 2006 to meet the new requirement. Since the arsenic concentrations appear to be a natural constituent of the aquifer, the Kanaka Rapids Ranch Water System Inc. will have to deal with this problem. Nitrate levels have been consistently below 2.0 mg/l. No VOCs, SOCs, or microbial contaminants have been detected in the wells.

Section 4. Options for Drinking water protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources. If the system should need to expand in the future, new well sites should be located in areas with as few potential sources of contamination as possible, and the site should be reserved and protected for this specific use.

For the Kanaka Rapids Ranch Water System Inc., drinking water protection activities should first focus on continued maintenance of the wellhead and sanitary seal. Additionally, the sanitary survey of April 2001 states that all well locations need cleaning, birds are entering well house #2, all discharge to waste lines must be screened and faced downward. These deficiencies should be corrected.

If total coliform bacteria have been detected in the system water, the Kanaka Rapids Ranch Water System Inc. should consider installing a disinfection system if this problem arises. Though treatment of fluoride is not required between 2.0 mg/l and 4.0 mg/l, the levels should be closely monitored as the source water has recorded concentrations above the secondary MCL of 2.0 mg/l. Any spills from the potential contaminant sources or nearby creeks should be carefully monitored, as should any future development in the delineated areas. Other practices aimed at reducing the leaching of agricultural chemicals from agricultural land within the designated source water areas should be implemented.

Because the arsenic in the wells is greater than the level of the revised MCL, the system may need to consider implementing engineering controls to monitor and maintain or reduce the level of this contaminant in the water system. The EPA plans to provide up to $20 million over the next two years for research and development of more cost-effective technologies to help small systems meet the new MCL (www.epa.gov). The Kanaka Rapids Ranch Water System Inc. will likely need to investigate engineering controls of the natural arsenic in the water. Currently, the EPA has stated that these upgrades must be completed by the year 2006. Most of the designated areas are outside the direct jurisdiction of the Kanaka Rapids Ranch Water System Inc. Twin Falls County has a Wellhead Protection Overlay District Ordinance that can provide additional protection for areas outside the direct jurisdiction of the Kanaka Rapids Ranch Water System Inc.

Partnerships with state and local agencies and industry groups should be established and are critical to success. Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan as the delineations are near residential land uses areas. Public education topics could include proper lawn and garden care practices, household hazardous waste disposal methods, proper care and maintenance of septic systems, and the importance of water conservation to name but a few. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA. There are transportation corridors near the delineations, therefore the Department of Transportation should be involved in protection activities

if Kanaka Rapids Ranch Water System Inc. chooses drinking water protection. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the local Soil Conservation District, and the Natural Resources Conservation Service.

A community must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Twin Falls Regional Office of the DEQ or the Idaho Rural Water Association.

Assistance

Public water suppliers and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In the future, public water system assessments and protection plans may be found on the DEQ website. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

Twin Falls Regional DEQ Office	(208) 736-2190
State DEQ Office	(208) 373-0502

Website: http://www.deq.state.id.us

Water suppliers serving fewer than 10,000 persons may contact Melinda Harper, Idaho Rural Water Association, at 1-208-343-7001 for assistance with drinking water protection (formerly wellhead protection) strategies.

POTENTIAL CONTAMINANT INVENTORY
LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as ASuperfund≅ is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.

References Cited

Cosgrove, D. M., Johnson, G. S., Brockway, C. E., Robison, C. W., *Geohydrology and Development of a Steady State Ground Water Model for the Twin Falls, Idaho Area*, 1997, Idaho Water Resources Research Institute, University of Idaho, Research Technical Completion Report.

Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, 1997. "Recommended Standards for Water Works."

Idaho State Department of Agriculture, 1998. Unpublished Data.

Idaho Department of Environmental Quality, 1997. Design Standards for Public Drinking Water Systems. IDAPA 58.01.08.550.01.

Idaho Department of Water Administration, 1966. Groundwater conditions in Idaho. Water Information Bulletin No. 1.

Idaho Department of Water Resources, 1993. Administrative Rules of the Idaho Water Resource Board: Well Construction Standards Rules. IDAPA 37.03.09.

Idaho Division of Environmental Quality, 1999. Idaho Source Water Assessment Plan.

Lewis, R. E., Young, H. W., *The Hydrothermal System in Central Twin Falls County, Idaho*, 1989, USGS Paper 88-4152.

Lewis, R. E., Young, H. W., *Geothermal Resources in the Banbury Hat Springs Area, Twin Falls County, Idaho*, 1982, USGS Water Supply Paper 2186.

Moffatt, R.L., Jones M. L., *Availability and Chemistry of Ground Water on the Bruneau Plateau and Adjacent Eastern Plain in Twin Falls County, South-Central Idaho*, 1984, USGS Water Resources Investigation Report 8404056.

Ralston, D. R., Young, N. C., *Water Resources of the Twin Falls Tract Twin Falls County, Idaho*, 1971, Idaho Department of Water Administration, Water Information Bulletin No. 22.

Attachment A

Kanaka Rapids Ranch Water System Inc.
Susceptibility Analysis
Worksheets

The final scores for the susceptibility analysis were determined using the following formulas:

1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)

2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.35)

Final Susceptibility Scoring:

0 - 5 Low Susceptibility

6 - 12 Moderate Susceptibility

≥ 13 High Susceptibility

Ground Water Susceptibility Report Public Water System Name : KANAKA RAPIDS RANCH Well# : MAIN WELL #1 S
Public Water System Number 5420089 05/03/2002 9:50:33 AM

1. System Construction		SCORE
Drill Date	07/20/1979	
Driller Log Available	YES	
Sanitary Survey (if yes, indicate date of last survey)	YES	2001
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	YES	0
Casing and annular seal extend to low permeability unit	NO	2
Highest production 100 feet below static water level	YES	0
Well located outside the 100 year flood plain	YES	0
	Total System Construction Score	3

2. Hydrologic Sensitivity		
Soils are poorly to moderately drained	YES	0
Vadose zone composed of gravel, fractured rock or unknown	YES	1
Depth to first water > 300 feet	NO	1
Aquitard present with > 50 feet cumulative thickness	NO	2
	Total Hydrologic Score	4

3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	DRYLAND AGRICULTURE	1	1	1	1
Farm chemical use high	YES	2	0	2	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		3	1	3	1

Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	NO	0	0	0	0
(Score = # Sources X 2) 8 Points Maximum		0	0	0	0
Sources of Class II or III leacheable contaminants or	YES	2	0	0	
4 Points Maximum		2	0	0	
Zone 1B contains or intercepts a Group 1 Area	YES	0	0	2	0
Land use Zone 1B	Greater Than 50% Non-Irrigated Agricultural	2	2	2	2
Total Potential Contaminant Source / Land Use Score - Zone 1B		4	2	4	2

Potential Contaminant / Land Use - ZONE II					
Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Land Use Zone II	Greater Than 50% Non-Irrigated Agricultural	1	1	1	
Potential Contaminant Source / Land Use Score - Zone II		4	4	4	0

Potential Contaminant / Land Use - ZONE III					
Contaminant Source Present	YES	1	1	1	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0	
Total Potential Contaminant Source / Land Use Score - Zone III		2	2	2	0
Cumulative Potential Contaminant / Land Use Score		13	9	13	3

4. Final Susceptibility Source Score		10	9	10	8
5. Final Well Ranking		Moderate	Moderate	Moderate	Moderate

Ground Water Susceptibility Report Public Water System Name : KANAKA RAPIDS RANCH Well# : RIVERSIDE WELL2

Public Water System Number 5420089 05/03/2002 9:50:43 AM

1. System Construction		SCORE				
Drill Date		10/10/1979				
Driller Log Available		YES				
Sanitary Survey (if yes, indicate date of last survey)		YES	2001			
Well meets IDWR construction standards		NO	1			
Wellhead and surface seal maintained		YES	0			
Casing and annular seal extend to low permeability unit		NO	2			
Highest production 100 feet below static water level		YES	0			
Well located outside the 100 year flood plain		YES	0			
	Total System Construction Score		3			
2. Hydrologic Sensitivity						
Soils are poorly to moderately drained		YES	0			
Vadose zone composed of gravel, fractured rock or unknown		YES	1			
Depth to first water > 300 feet		NO	1			
Aquitard present with > 50 feet cumulative thickness		NO	2			
	Total Hydrologic Score		4			
3. Potential Contaminant / Land Use - ZONE 1A			IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	DRYLAND AGRICULTURE		1	1	1	1
Farm chemical use high		YES	2	0	2	
IOC, VOC, SOC, or Microbial sources in Zone 1A		NO	NO	NO	NO	NO
	Total Potential Contaminant Source/Land Use Score - Zone 1A		3	1	3	1
Potential Contaminant / Land Use - ZONE 1B						
Contaminant sources present (Number of Sources)		YES	1	1	1	1
(Score = # Sources X 2) 8 Points Maximum			2	2	2	2
Sources of Class II or III leacheable contaminants or		YES	3	1	1	
4 Points Maximum			3	1	1	
Zone 1B contains or intercepts a Group 1 Area		YES	0	0	2	0
Land use Zone 1B	Greater Than 50% Non-Irrigated Agricultural		2	2	2	2
	Total Potential Contaminant Source / Land Use Score - Zone 1B		7	5	7	4
Potential Contaminant / Land Use - ZONE II						
Contaminant Sources Present		YES	2	2	2	
Sources of Class II or III leacheable contaminants or		YES	1	1	1	
Land Use Zone II	Greater Than 50% Non-Irrigated Agricultural		1	1	1	
	Potential Contaminant Source / Land Use Score - Zone II		4	4	4	0
Potential Contaminant / Land Use - ZONE III						
Contaminant Source Present		YES	1	1	1	
Sources of Class II or III leacheable contaminants or		YES	1	1	1	
Is there irrigated agricultural lands that occupy > 50% of		NO	0	0	0	
	Total Potential Contaminant Source / Land Use Score - Zone III		2	2	2	0
Cumulative Potential Contaminant / Land Use Score			16	12	16	5
4. Final Susceptibility Source Score			10	10	10	9
5. Final Well Ranking			Moderate	Moderate	Moderate	Moderate